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ABSTRACT

This booklet describes online searching using Materials Information, a metallurgy and metals science information service of the Institute of Metals in London and ASM International in Cleveland, Ohio, which is available through the major online vendors. Described in detail are online searching, online databases, costs, online hosts or vendors, telecommunications and equipment needed, procedures for getting online, search strategies, and where to go for help. An insert sheet provides the headquarters addresses of online hosts or vendors in both the United States and Europe. (EW)

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GOING ON LINE

The MI Way

IR052696

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Materials Information is the joint, not-for-profit information service of the Institute of Metals in London and ASM International in Cleveland, Ohio. Since 1966, it has been providing technical information on metallurgy and materials science to thousands of research centres, universities, companies, libraries and governments around the world. Materials Information has more than 50 staff divided equally between its offices in the UK and USA. Its products include abstracts journals and online databases (with their associated reference volumes and user aids) backed up by the Custom Online Search Service, Document Photocopy Service and Translations Service.

TABLE OF MATERIALS INFORMATION DATABASES AND THEIR ONLINE HOSTS

Database	*Host*	*Filename*
METADEX	DIALOG	32
	ESA-IRS	3
	ORBIT	MDEX
	STN International	METADEX
	CAN/OLE	
	CEDOCAR	
	DATA-STAR	META
	FIZTECHNIK	[Late 1988]
ENGINEERED MATERIALS ABSTRACTS	DIALOG	293
	ESA-IRS	134
	ORBIT	EMA
	STN International	[1989]
MATERIALS BUSINESS FILE (MBF)	DIALOG	269
	ESA-IRS	111
	ORBIT	MATERIALS/B
	DATA-STAR	MBUS
	CAN/OLE	MBF
	STN International	MATBUS
	CEDOCAR	
	TEXTLINE	Part of the main business file
METALS DATAFILE	ORBIT	MDF/I
	ESA-IRS	125

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GOING ONLINE THE MI WAY

By Jill Feldt
Materials Information
1988

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What is Online Searching?
Online Databases
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Copies of this booklet can be obtained from Materials Information, but please feel free to make as many extra photocopies as you need.

WHAT IS ONLINE SEARCHING?

Online searching is a powerful, time-saving method of finding the information you need. You can search the world's technical literature – present and past – to find journal articles, conference papers, books, patents and other documentation in your subject area; you can do it from a terminal or microcomputer in your own office; and it only takes a matter of minutes.

ONLINE DATABASES

Carrying out an online literature search involves accessing remote *databases* – vast machine-readable stores containing information about thousands of documents. A database consists of *records*, which are packages of information about each document. The illustration below shows a typical record from Materials Information's METADEX database, which covers the world's literature on the science and technology of metals.

A record is split into *fields*; one field contains the title of the document, another contains the authors, others contain the subject descriptors and data such as the document type. Most records also contain an abstract – a summary of the contents of the original document. A database is interrogated primarily by means of keywords; by selecting these and combining them in an appropriate way the subject area is defined and records of relevant documents are pinpointed. The word "online" refers to the fact that searching is an *interactive* process – you and the computer are conversing in real time, and you can modify the direction of your search according to the response you get from the database. The final result of a successful search will be a list of references on your topic, each with full bibliographic details. There is often the possibility of ordering the documents themselves online from the producer of the database.

METADEX is a typical *bibliographic* database – each record describes a published document and gives you the details which you would require in order to obtain it from a library. In addition, *full-text* databases are available which contain whole documents (for example newspaper articles) in computer-searchable form. There are also online *databanks* of numerical information (such as Materials Information's METALS DATAFILE).

METADEX: A SAMPLE RECORD

56-0450 METADEX 88012723 Issue 8804
Laser Treatment of Tool Steels.
Uglov, A. A.; Medres, B. S.; Solv'ev, A. A.
Fiz. Khim. Obrab. Mater. 1987; (3); 6–10; ISSN 0015-3214; in Russian

The character of structure changes in the zones of laser surface strengthening and surface alloying of R18, R9K5, R12F2K8M3, Kh12M, 9KhS tool steels has been studied. The PM-15 graphite powder has been used as a coating material. The samples heat treated in different ways have been processed according to two technologies: treatment at the metal surface temperature equal to quenching temperature and a process with surface temperature above quenching temperature and below melting temperatures (1300–1400 deg C). The service life of treated tools has been investigated. It was shown that the laser treatments form a surface zone with high hardness or high strength at treatment temperatures respectively equal or above the quenching temperature. The increase in service life of the tool depended on the conditions of laser treatment, design of cutting tool and peculiarities of its use. 9 ref. – M.L.

Category: 56

Controlled Terms: Tool steels/Heat treatment/Laser beam annealing/Surface hardening/Cutting tools/Service life/Hardness/Coating effects

Alloys: R18/R9K5/R12F2K8M3/Kh12M/9KhS/ST

WHAT DOES IT COST?

There are three components which make up the total cost of an online search:

Telecommunications costs – you pay the cost of transmitting information between your computer and the computer on which the database is held. If you have access to a public data network, costs are typically $10–$15 per hour.

Access time – you pay for the time which you spend searching in a database. Prices of databases vary, but they average about $65 per hour.

Print charges – displaying and printing records from the database involves extra costs. Again, these vary between databases; different charges apply for different types of printout, averaging about 40 cents per record.

A rough approximation of the cost of an ordinary search of moderate size would be $50–$75. Bear in mind, though, that no two searches are the same – and also that your searches will become more economical as your proficiency increases.

GOING ONLINE – THE MI WAY

In this booklet we hope to give you some idea of what is involved in online searching – from the very beginning when you set up your equipment, to the moment when you go online and search for the first time. If having read it you need to know more, Materials Information is always here to help. Some useful contacts are also given on a sheet inserted at the back of this booklet. If you decide that "doing it yourself" is not for you, Materials Information has many other services to offer – for example custom online searching, where we do the work for you (you can even ask us to repeat your literature search on a regular basis so that you are kept up to date with publications in your field).

This booklet can only give you a taste of what online searching can do – the best way to find out all the details is to see a database in action. Why not invite yourself along to one of our free training seminars?

ONLINE HOSTS

Databases are made available to the public through online *hosts*, sometimes referred to as *vendors*. A host may load as many as one or two hundred databases on to its mainframe, and may offer databases in any subject area from science and technology to business and the humanities. A rough analogy can be drawn with bookselling: if the database is the book, then the database producer is its author and the host system is its publisher. Note, however, that some databases are available on more than one host system.

Materials Information's databases can be found on the following hosts:

CAN/OLE	DIALOG	ORBIT
CEDOCAR	ESA-IRS	STN
DATA-STAR	FIZ-TECHNIK	TEXTLINE

To gain access to the host computer you will first need to sign up as a customer of the host system. (The addresses of MI's hosts are given on a sheet at the back of this booklet; they should be contacted direct.) You will be assigned a password and, in some cases, an additional identification number. Becoming a customer of an online host gives you access to all the publicly available databases on that system.

Most hosts do not make an upfront charge; access to the computer is on a pay-as-you-go basis. It is vitally important to keep your password confidential because all database use, whether authorised or not, will be billed to the holder of the password.

It is a good idea to sign up with more than one host; in this way, as well as having a wider choice of databases, you can often access the database you require even if one of the hosts is "down".

Each host uses its own search language. Although the commands are broadly similar, they will be entered in a different way on each system. Database records will also appear in a slightly different format on each host and search capabilities may vary. It is worth spending time familiarising yourself with the language and features of your chosen hosts(s); most of them offer excellent basic training workshops and free online time for beginners. The system manual is the definitive reference guide, but for everyday online searching the most useful documentation is the set of database information sheets provided by the host; it is important to keep your collection of these up-to-date. Hosts also issue free newsletters to publicise system enhancements and new database features – watch out for free online time, which is often offered in connection with the launch of a new database.

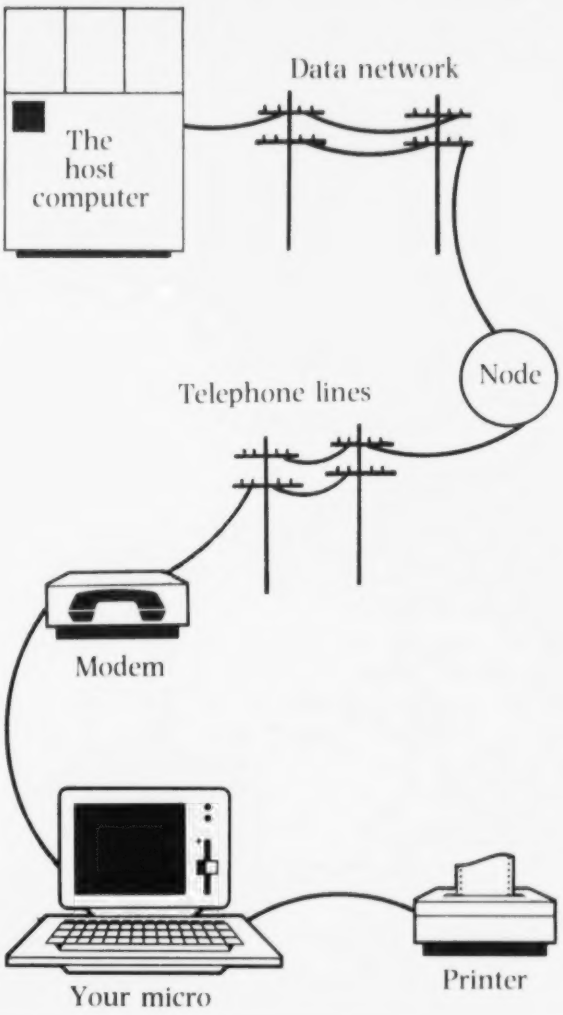
THE TELECOMMUNICATIONS LINK

The connection between your own microcomputer or terminal and the remote host computer is made via ordinary telephone lines, but for part of

its journey the information will probably pass along special data networks which are much cheaper to use. These networks are reached by making a local telephone call to the nearest *node* or access point: from there, the call is automatically switched through on to the long-distance route.

Depending on your location, much of your online searching will probably involve calls to hosts abroad – but your telecommunications costs for these data calls will be far less than they would be for the equivalent voice calls. Most countries have their own communications networks linking into the international data systems. In many cases the PTTs own the networks, so you should contact them direct for contracts, passwords and advice. In other countries (eg the USA) there are several networks from which to choose: different passwords will be needed for each. Another option which is sometimes available is a network owned by one of the hosts: in this case, one contract will cover both network and database use.

MAKING THE CONNECTION



THE EQUIPMENT

So what equipment do you need for online searching? Ten years ago almost all searchers used a dumb terminal – a piece of equipment like a portable typewriter (with no memory), linked to the telephone using a built-in acoustic coupler. They were reasonably compact all-in-one units that did not require a separate printer or modem. But they were very slow when printing data and therefore expensive to use online. Although they offered no flexibility, they were simple and reliable. Many of them are still used, if only as back-ups. Access by telex was also used and is still useful if telecommunications are poor. However this has one additional disadvantage – it is not interactive.

Most online searching today is carried out using a microcomputer linked by a modem to a network that carries data to and from the host computer.

The Microcomputer

Most micros are IBM compatible, but this is not essential for online searching. A hard disk is almost indispensable: you can search with a twin floppy machine but it is difficult, particularly as large volumes of data can be involved. A machine with a 10 megaByte hard disk (Winchester disk) and 256K of RAM memory is really the practical minimum. The PC should have an RS232 port and an asynchronous communications card – both of these usually come as standard items.

Telephone Line

It is preferable to use a direct outside line rather than making the call via a switchboard. This reduces the chances of disconnections, line noise, and other disturbances.

Modem

To link the PC to the phone (and on to the data lines) you must have a modem. This can be either an internal part of the PC or a separate piece of equipment. The modem connects the computer to the phone. Data can be transmitted at a wide range of different speeds (measured as a *baud rate*) – make sure you choose a modem that will operate at a speed that the host computer can handle. Usually this is 1200 baud in both directions (1200/1200) but faster speeds are possible and will become the norm. Some of the lower priced modems operate at the split speed (1200/75) used by Teletext services, which means that data is received at 1200 but transmitted at 75. These modems can be used for online searching as long as either the modem or the communications

software has the ability to buffer the outgoing data up to 1200 baud – this is often referred to as *intelligence*. When dialling into your local node, remember that different phone numbers are used for different baud rates.

Software

You will also require a *terminal emulation software package* (otherwise known as *comms software*) to enable the PC to function as a remote keyboard of the host computer. The cheapest packages may do only that: most offer additional features some of which are essential for online searching. Things to look for include:

- The ability to upload and download data and to turn this on and off in the middle of a search
- The ability to create strategies before you go online and then to transmit them to the host. It is useful to be able to review the search terms whilst online and to alter them
- The ability to transmit complete text files (for example photocopy requests or book orders)
- An easy set-up procedure for each host, with lots of flexibility
- An automated logon procedure preferably with automatic telephone dialling
- A clear manual, good training and support

In practice there is often little to choose between the packages. Check for local availability, training and support – particularly if you are new to online.

Once you have got your micro, your modem and your host computer talking to each other you are ready to search. The next thing to consider is what to do with the data.

Printer

You must have a printer, or at least access to one. Your choice will depend on what else you want to use it for (do you want to print letters, for example?), how fast you want it to be, how much noise you can accept, and how much you are willing to pay. Bear in mind that a slow printer may stop you using your PC for other things whilst it is printing.

Online Display and Offline Printing

Host systems generally offer two printing options: *online* and *offline*.

Whilst you are searching, you can display retrieved records on your screen in a number of different *formats* (title only, bibliographic details, full record including abstract, etc). An extra charge is made for records displayed online; prices vary for different databases and different formats. Displaying records on the screen is a very useful way of spot-checking search results, but it uses precious online time and costs can quickly mount up.

The most cost-effective way to print a large set of references is to order offline prints from the host. Enter your print command at the end of the search, and the results will be run off for you overnight on the host's mainframe (again, at a price depending on database and format). Offline prints are usually neatly presented on quality paper (not continuous computer stationery); their disadvantage is that they can take up to a week to reach you, depending on the postal service.

Downloading

One of the great advantages of searching with a PC is that you can *download* the data to disk and print it after you have logged off. This gives you the results quickly and also allows you to manipulate the data. Bear in mind, though, that downloading is not instantaneous – at 1200 baud you can still just about read the records as they pass across the screen. Once the data is written to the disk you can print it at your leisure; you can take your search result into a wordprocessor, delete all the unwanted material, add your own references, put on a title and make a really attractive bibliography.

You can also *reformat* the data to create records for your own in-house database. Check the copyright situation first: downloading and reformatting data from MI databases is permitted provided that you use the special downloading commands and display formats of the hosts – that way you pay a little extra for the privilege but in return get machine-readable records with *field labels* (essential for reformatting).

To take records into your own text retrieval package, you will need to reformat the data to the structure that corresponds to your database package. A number of software packages are available to do this automatically; most, but not all, are linked to specific hosts, databases, or retrieval software.

GETTING ONLINE

You've got the right equipment, set up your comms software, signed up with a host. . . . Now comes the moment when you go online for the first time.

1. Dial your nearest node, either manually or automatically.

2. When the connection is made, you will probably need to enter a network password and the address of the host (a code identifying the host computer – the final destination of your call). These codes are network specific.

3. Once you are through to the host system, a welcome message will appear on the screen.

4. Log in to the host by entering your password (and identifier if required).

5. Enter the file number or name of your chosen database and start your search. Some hosts make your initial choice of database easier by allowing you to compare relative term frequencies. Or you may be able to search across several files simultaneously.

All or part of the above procedure may be automated, depending on the type of equipment which you are using.

Major problems are rare and, with improvements in equipment and telecommunications, going online is becoming much easier and more trouble-free. However, no system can ever be 100% reliable and there will be occasions when you are unable to connect to the database you need. If you are having problems, first check your telephone and computer equipment. It is often something as simple as a loose connection. If the problem is further along the line, it could be network congestion or a telecommunications fault. Very often, the line will be clear if you try the call again a few minutes later. The problem could also lie with the host. If your particular database is unavailable, this should be announced in the host's connect-message. Not all hosts offer a 24hr service, and there will be occasions when the host computer is "down" for repair or maintenance. The host's help desk will be able to give you advice on availability; telephone numbers are given on the inserted sheet.

When you have finished your search, log off from the host. Most hosts will end your session by showing the time spent online and the approximate costs incurred.

If you are "dropped" during your search – that is, if your connection to the host is suddenly broken – simply log back in. In most cases you will go straight back into the same database and you will be able to resume from the point where your work was interrupted. If you are unable to log back in (because of telecommunications or other problems) don't worry about mounting costs – the host will automatically log your password off if no commands are entered after a certain number of minutes.

THE BASICS OF SEARCHING

Online searching is an essentially logical process. Remember that you will only retrieve **exactly** what you ask for – a computer does not work like a librarian who knows the background to the search and can add personal knowledge of the subject area and assumptions about the type of material required. One of the most important parts of your search is the planning and structuring which you do before you go online: your *search strategy* must define your subject in a clear and unambiguous way. Once online, you can of course modify your requests according to the results you obtain – your search is a two-way conversation between you and the computer.

Let's have a look at a very simple example: searching the METADEX database (on the ESA-IRS host system) to find articles on corrosion problems in aircraft. The results would look like this:

```
? s corrosion
   1 58562 CORROSION
? s aircraft
   2  3927 AIRCRAFT
? s aeroplane?
   3    24 AEROPLANE?
? c 2 or 3
   4  3944 2 OR 3
? c 1 and 4
   5   761 1 AND 4
```

The first step is to search for the keyword CORROSION. The computer responds by telling us that in the database there are a total of 58562 records which contain that keyword. These are assigned the set number "1". Next, we look for records containing the keywords AIRCRAFT **or** AEROPLANE, searching for them separately and then combining the two sets of references together. It is important to include all appropriate synonyms and related terms – in a real situation we would use a much more comprehensive list of keywords. Note the use of the "?" for truncation: we are searching for both "aeroplane" and "aeroplanes". The final step is to find records which contain all the required keywords – both CORROSION **and** one of the terms AIRCRAFT, AEROPLANE or AEROPLANES.

The logic which is used to manipulate sets of records during an online search is known as *Boolean logic*. In addition to the *AND* and *OR* operators which we have seen in use above, the *NOT* operator can be used to **exclude** unwanted keywords from the search (but it should be used with caution because relevant records can easily be lost).

Our set of references on corrosion in aircraft contains 761 records, which is rather too many to print out. So we need to refine the search in some way – but it may be useful to display a few titles on the screen first so that we can check our strategy. We can modify the set of records by incorporating further keywords into the search, or we can *limit* the set by date or language or document type (journal article, conference paper or patent, for example).

So far, we have been *free-text searching* – searching for keywords without specifying which parts of the record are to be searched. For the most efficient and accurate subject searching the *controlled index terms* (sometimes referred to as *descriptors*) should be used. Most databases have controlled vocabularies – they enable the indexers who produce the records and the searchers who use them to share a common language. Controlled terms for MI's databases are published in the THESAURUS OF METALLURGICAL TERMS and the THESAURUS OF ENGINEERED MATERIALS, both of which can also be consulted online on most hosts. A thesaurus will guide you through the technical vocabulary and can be especially useful for searchers who are not familiar with the subject area or its terminology. In contrast with a dictionary, a thesaurus does not assign precise definitions to words; it shows each term in its hierarchical relationship with other terms, indicating preferred synonyms and broader, narrower and related terms.

Different hosts and databases have slightly different features and capabilities, but all work on basically the same principles. You will become familiar with a variety of search techniques, each helping to solve particular types of search problem. Some databases operate on a framework of subject sections; these enable you to confine your search to a broad subject area. Various detailed indexes, such as METADEX's ALLOYS INDEX, are also available. In addition to carrying out a literature search in a subject area, you can use databases for finding information on a particular document – by searching on the authors' names, keywords in the title, publication date, journal name, etc. During your search it is usually possible to focus in on a small segment of an index, for example the author index, to check spellings and adjacent terms (often referred to as *expanding* or *neighbouring*).

If you need to leave your search for a short while (to consult a reference book or answer the phone, for example) many hosts allow you to log off temporarily and return to your search a few minutes later – all your work will still be there and you will not have incurred any large costs for access time. If you think you might want to run your search again at a later date, or try the same strategy in a different database, you can *save* the commands in a separate file on the host computer and re-run the search by simply typing in its code number. Most hosts also offer an *SDI* facility whereby your strategy can be run automatically each month, enabling you to keep abreast of new items being added to the database in your subject area.

In this short space it has only been possible to look briefly at the basic techniques of online searching and there is no real substitute for hands-on experience. Be flexible and logical in your approach, and be sure that you are well-prepared before you log in. Make full use of the training and assistance offered by the hosts and the database producers:

User manuals and information sheets

Online tutorials (help files which you can access during your search) and low-cost training files

Workshops and seminars: all hosts offer introductory courses and many database producers give free training sessions

Help desks (useful phone numbers are given on a sheet at the back of this booklet)

HEADQUARTERS ADDRESSES OF ONLINE HOSTS

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1. **ESA-IRS**

ESRIN,
Via Galileo Galilei,
00044 Frascati (Rome) ITALY

Tel: +39 6 94011
Help Desk: +39 6 9401302/3
Telex: 610637 ESRIN I
Fax: +39 6 9401361

2. **DIALOG**

Dialog Information Services Inc,
3460 Hillview Avenue,
Palo Alto, CA 94304 USA

Tel: +1 415 858 3810
(Toll Free in USA) 800-3-DIALOG (800 334 2564)
Telex: 334499 (DIALOG 8PLA)

3. **ORBIT**

Pergamon Orbit Infoline
8000 Westpark Avenue
McLean, Virginia 22102, USA

Tel: +1 703 442 0900
(Toll Free in USA) 800 421 7229
Fax: +1 703 893 4632

4. **STN**

STN International,
PO Box 2465,
D-7500 Karlsruhe 1,
FEDERAL REPUBLIC OF GERMANY

Tel: +49 7247/82-4566
Telex: 17724710+
Fax: +49 7247/2968

Continued.

5. **DATA-STAR**

D-S Marketing,
Plaza Suite,
114 Jermyn Street,
London, SW1Y 6HJ, UK

Tel: +44 1 930 5503
Telex: 946240 (quote ref 19021085)

6. **FIZ TECHNIK**

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